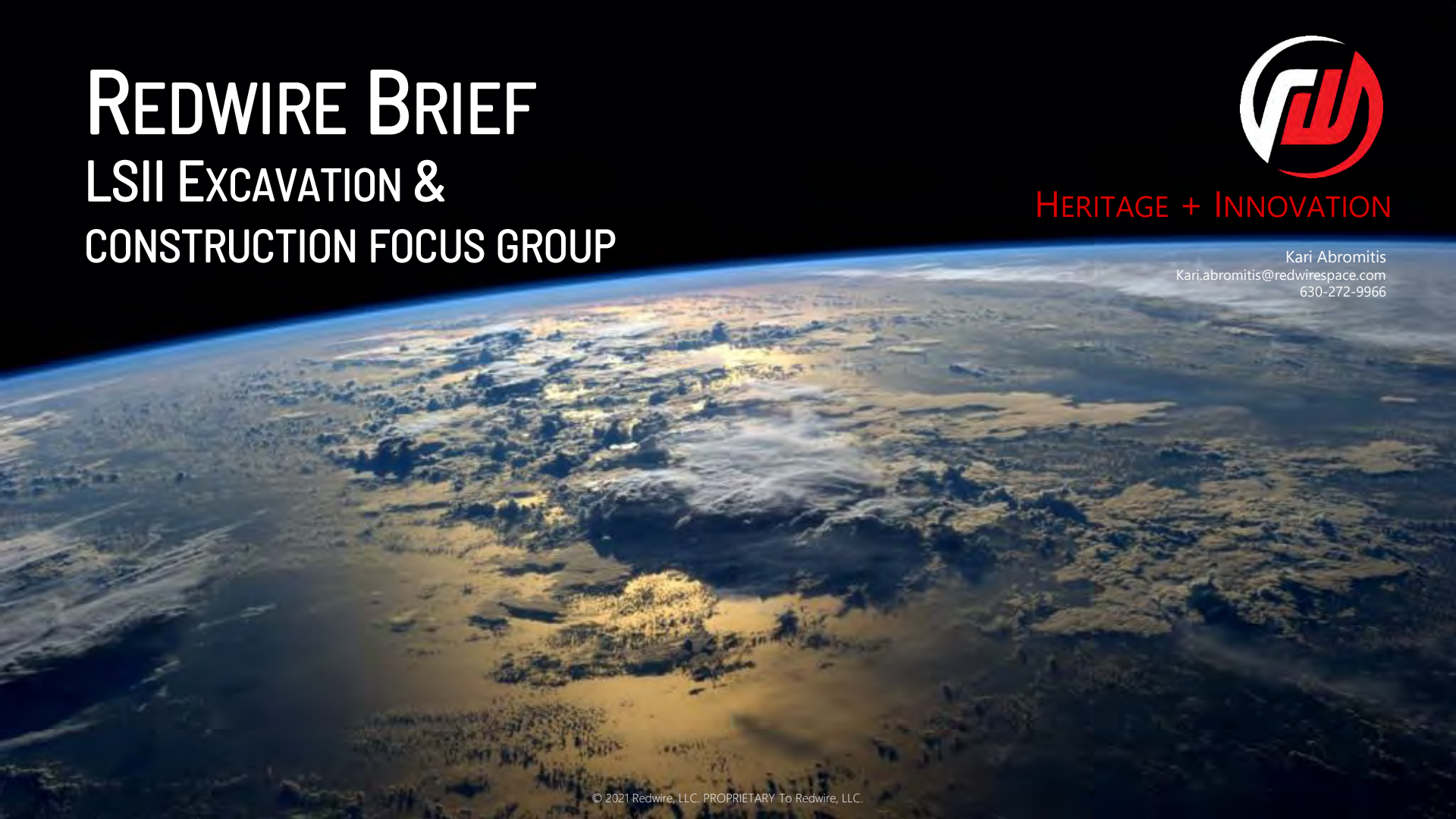
Redwire Brief

LSII Excavation & construction focus group

Heritage + Innovation

Kari Abromitis
Kari.abromitis@redwirespace.com
630-272-9966




REDWIRE
Our Mission
Redwire is accelerating humanity's expansion into space by delivering reliable, economical and sustainable infrastructure for future generations.
BUILD ABOVE

Redwire Strategic Locations

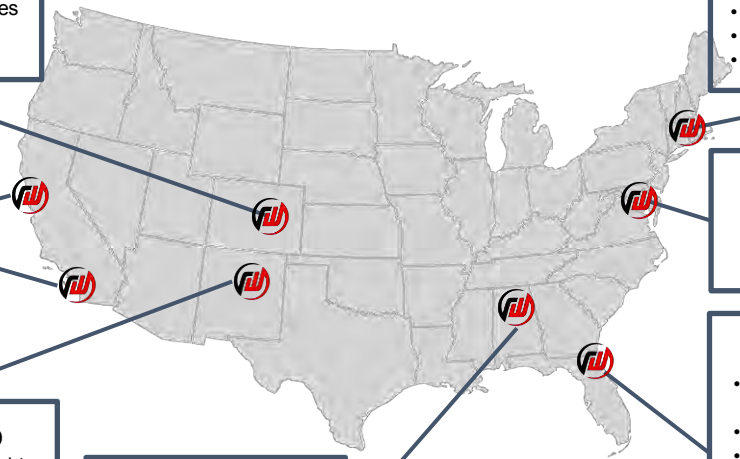
REDWIRE

COLORADO
- 29,000 sq. ft facility in Littleton
- Engineering Services
- Camera Systems
- Flight Avionics
- Data Recovery Systems
- In-House Testing Capabilities
- Digital Engineering
- Modeling & Simulation

CALIFORNIA
- 5,000 sq. ft facility
- ISS Payload Development
- Human spaceflight Avionics

NEW MEXICO
- Manage customer flight hardware testing facility at Kirtland AFB
- Launch Adapters
- Strong partnerships with AFRL, Space Force

ALABAMA
- 1,000 sq. ft facility
- Strong partnerships with NASA MSFC



MASSACHUSETTS
- 18,000 sq. ft. facility
- Clean Rooms
- Sun Sensors & Star Trackers
- Integrated Camera Systems
- ADACS Systems
- Satellite Systems

MARYLAND
- 2,000 sq. ft facility
- Customer and team focused DC-area facility

FLORIDA
- Redwire Corporate Headquarters in Jacksonville
- 35,000 sq. ft facility
- Clean rooms
- Advanced Space Manufacturing Technology
- Large Space Manufacturing Project – OSAM-2

EUROPE
- Luxembourg-based operations
- 2500 sq. ft facility
- Robotic Systems
- Avionics

DEEP SPACE SYSTEMS

ADCOLE Space
Heritage & Innovation

MADE IN SPACE
10 YEARS BUILD ABOVE

ROCCOR
A REDWIRE COMPANY

LoadPath
A REDWIRE COMPANY

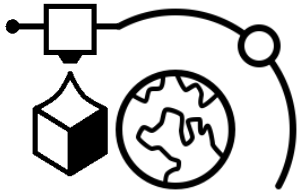
OAKMAN AEROSPACE

DSS Deployable Space Systems

Overview of Strategic Focus Areas

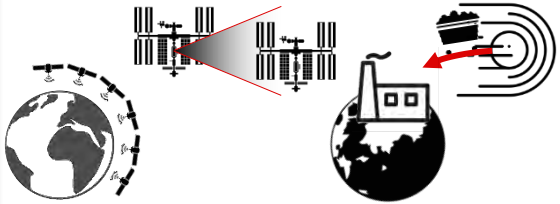
On-Orbit Servicing, Assembly & Manufacturing

Transformational Enabling Technology



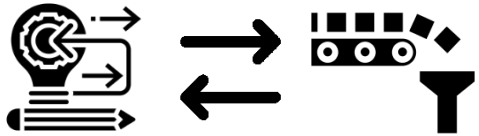
LEO Commercialization

Commercial Use and Habitation of Space



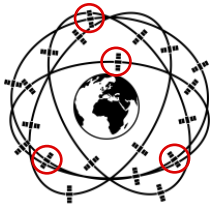
Digitally-Engineered Spacecraft

Modular, Mass-Producible Spacecraft



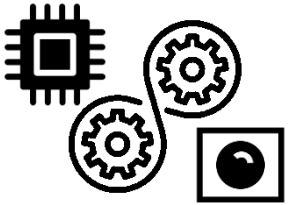
Space Domain Awareness & Resiliency

Asset Hardening Services and Resilient Systems



Advanced Sensors & Components

Low SWaP-C Components, Sensors and Systems



Orbital Laboratory Ambulatory Freezer (OLAF)

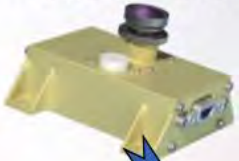
- Made In Space will soon provide portable cold stowage transportation services
- Maintains temperature colder than -68°C for 96 hours or more unpowered
- The first scheduled flight to the ISS in November 2021.
- Purposed for ISS but applicable to Lunar/Martian/other orbiting facilities
- Minimal redesign for lunar use could reach lunar relevant temperatures and would be functional in external vacuum and radiant conditions to enable the sample return strategy outlined in the Artemis III Science Team Definition Report.

Terrain Navigation & Cameras

Camera Controller Assembly
CCA50X

- Gigabit Ethernet
- File Management System
- Machine Vision Processing
- General Purpose Computer
- Open Linux Operating System

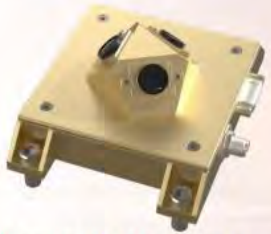
- 4K Video Compression Engine
- 5.8 GHz WiFi Client
- Ultra Compact
- On Board Data Storage



Wireless Camera
WLA50X

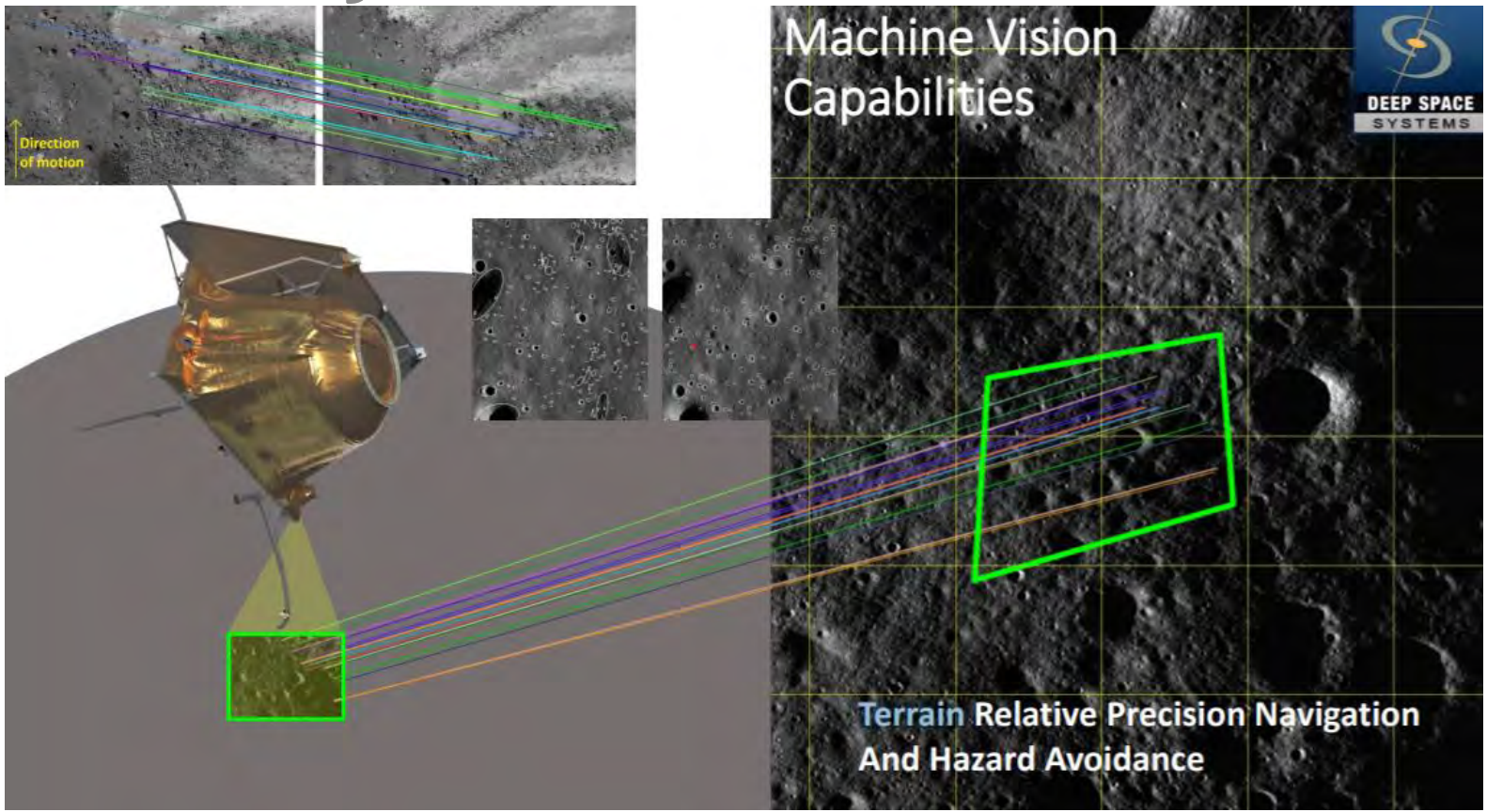
- Machine Vision Capable
  - Global Shutter
  - Uncompressed Full Frames
- Binning, Subframing, Region of Interest
- Gain, Gamma, White Balance, etc.

Wired Camera
WRA50X



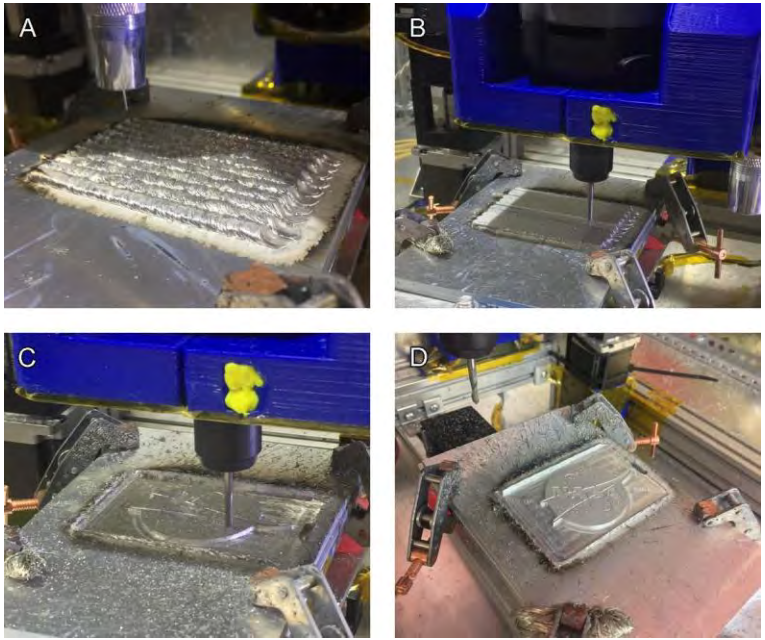
Argus Vision System

Terrain Navigation & Cameras



VULCAN

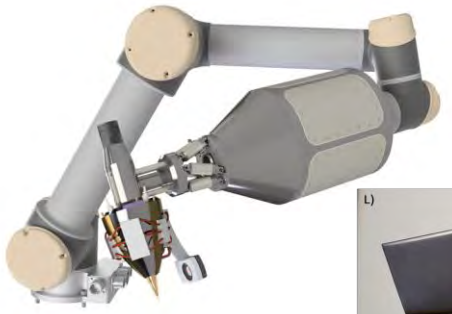
- Unique technology suite that incorporates both additive and subtractive manufacturing methods that are capable of processing multiple metals and polymers.
- Crucial for lunar and Martian human exploration missions
- On demand, finished parts with minimum infrastructure and consumables use
- In situ part repair, replacement, and generation of new components with minimum hardware and consumables.

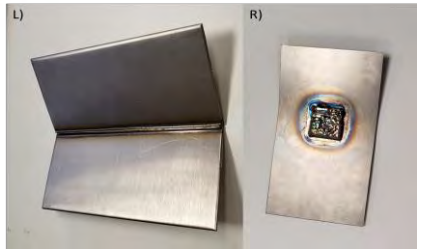


VULCAN Phase I Prototype A) depositing layers with the metal deposition subsystem then using the subtractive machining spindle to B) level the part surface and C&D) machining out the NASA logo

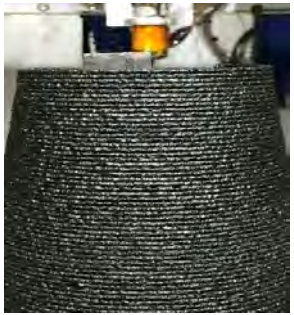
Mobile End-effector Laser Device (MELD)

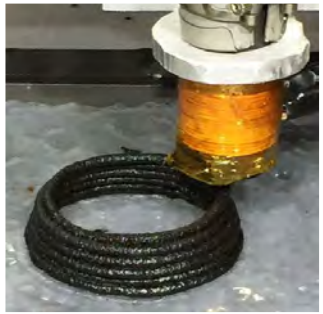
- Laser welding tool that is used on-orbit in extreme environments such as Low Earth Orbit (LEO), Geosynchronous Earth Orbit (GEO), and the Moon
- Fundamental to building large, stable structures on-orbit such as trusses, arrays, habitats, and pressure vessels
- Phase I Activities:
  - 600W Laser Deposition Demos
  - Welds w/ Ti6Al4V wire and plate and stainless steel 304 plate with 308 or Inconel wire
  - Hole repairs on unsupported surface w/ Ti6Al4V and 304 plate
  - Aluminum 7050 weld samples





RegISS - Regolith Printing





- The Additive Manufacturing Facility (AMF) will be modified to accommodate a new extruder and print with a feedstock consisting of regolith simulant and low-density polyethylene
- RegISS will be the first demonstration of manufacturing with ISRU-derived feedstocks on ISS.
- Flying to ISS in July of this year

Lunar Manufacturing Demonstration (LMD)

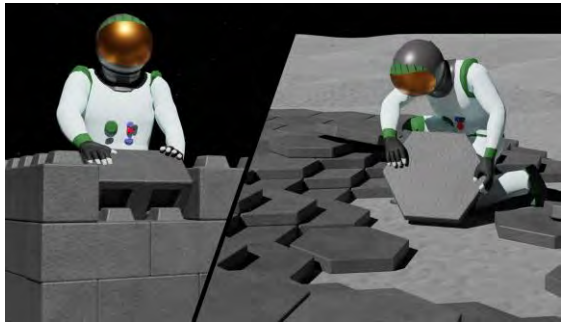
- Redwire has identified four unique LMD tools that are essential to Lunar Surface Innovation Initiative (LSII) goals for surface construction and ISRU.
- The four technologies are vital to the new lunar economy by creating infrastructure in situ, reducing launch mass, and therefore, drastically reducing cost.
- As each technology is scaled up, together they ensure sustainment of human presence on the Moon

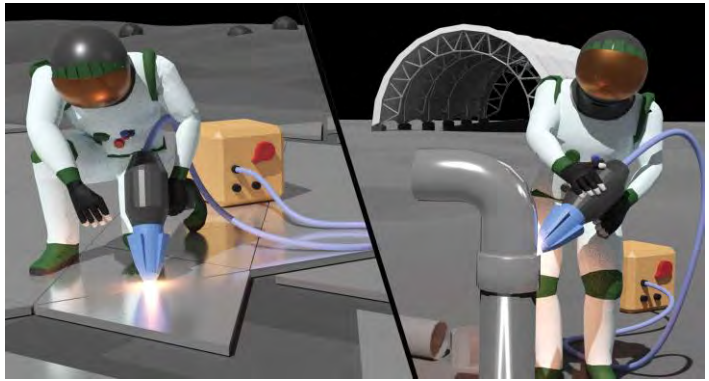
Lunar Welding
- Piping and Conduits
- Habitat Support Structures

Microwave Sintering of Regolith
- Bricks and Pads
- Radiation Shielding

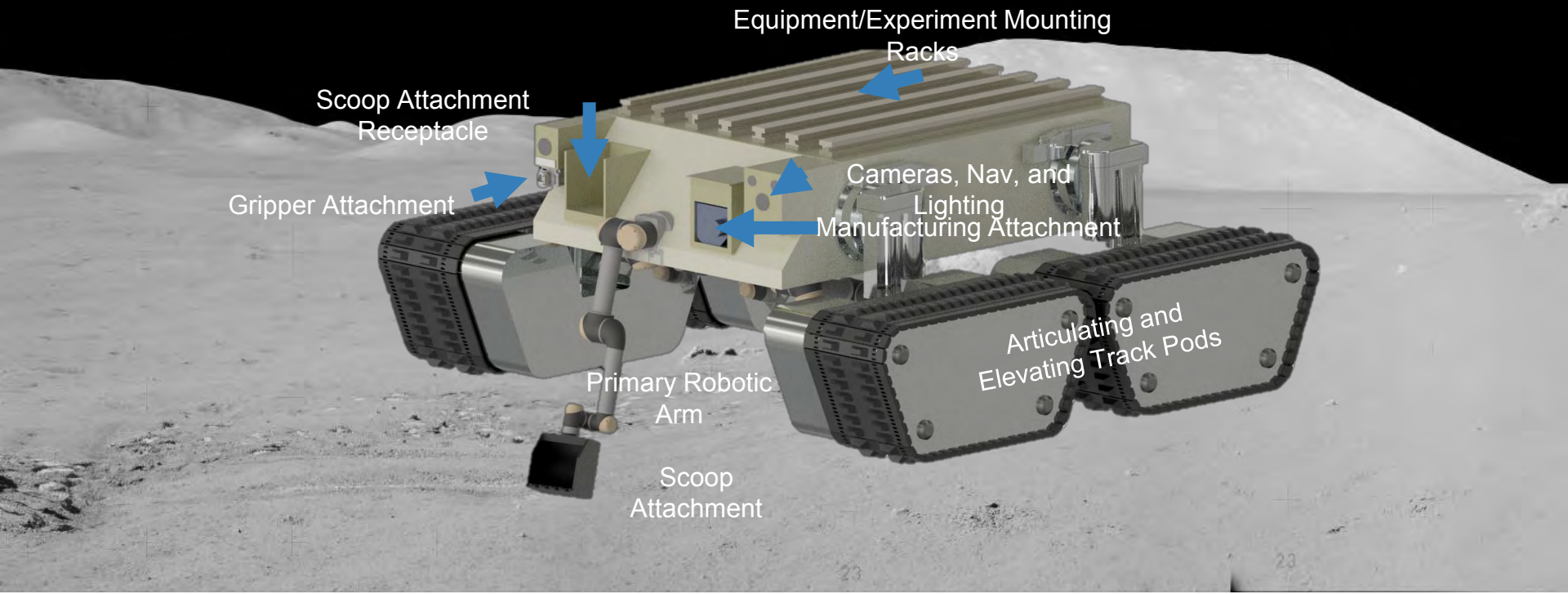
FGF of Regolith and Polymer
- Tools and Fasteners
- Replacement Parts

Basalt Fiber with Regolith
- Reusable Landing Pads
- Roads, Walls, and Berms



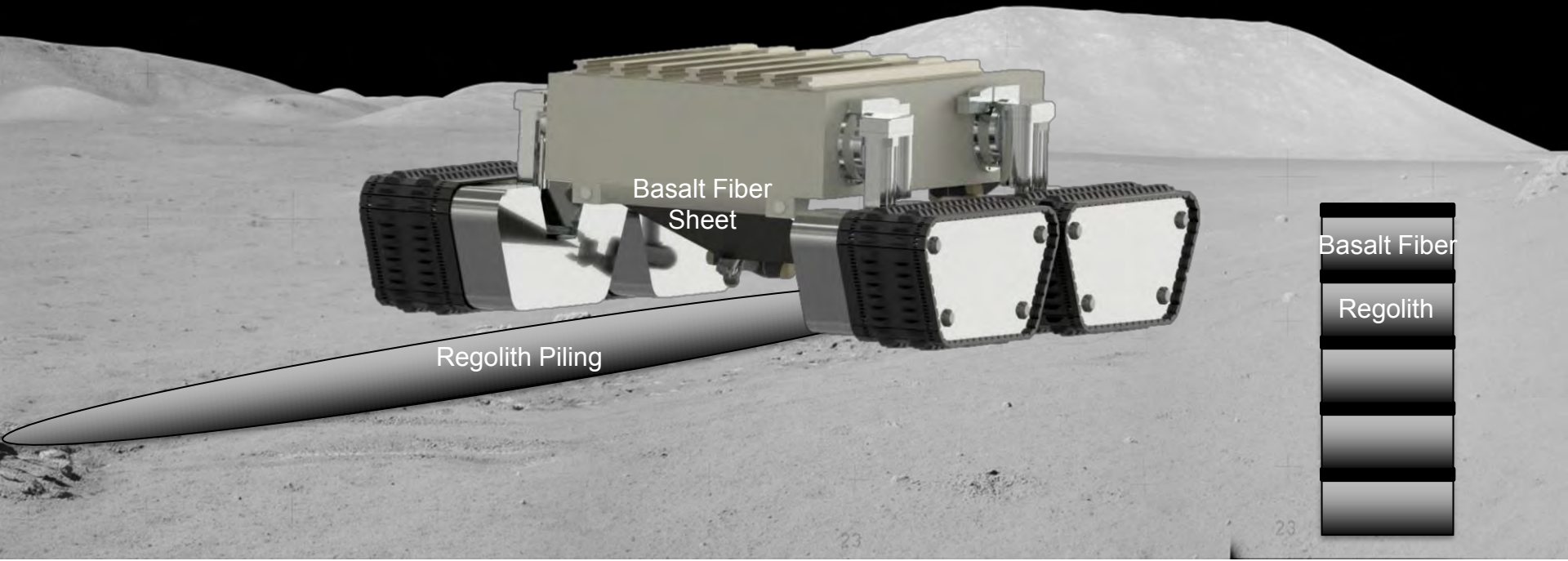


Robotic Heavy Lunar Construction Concept

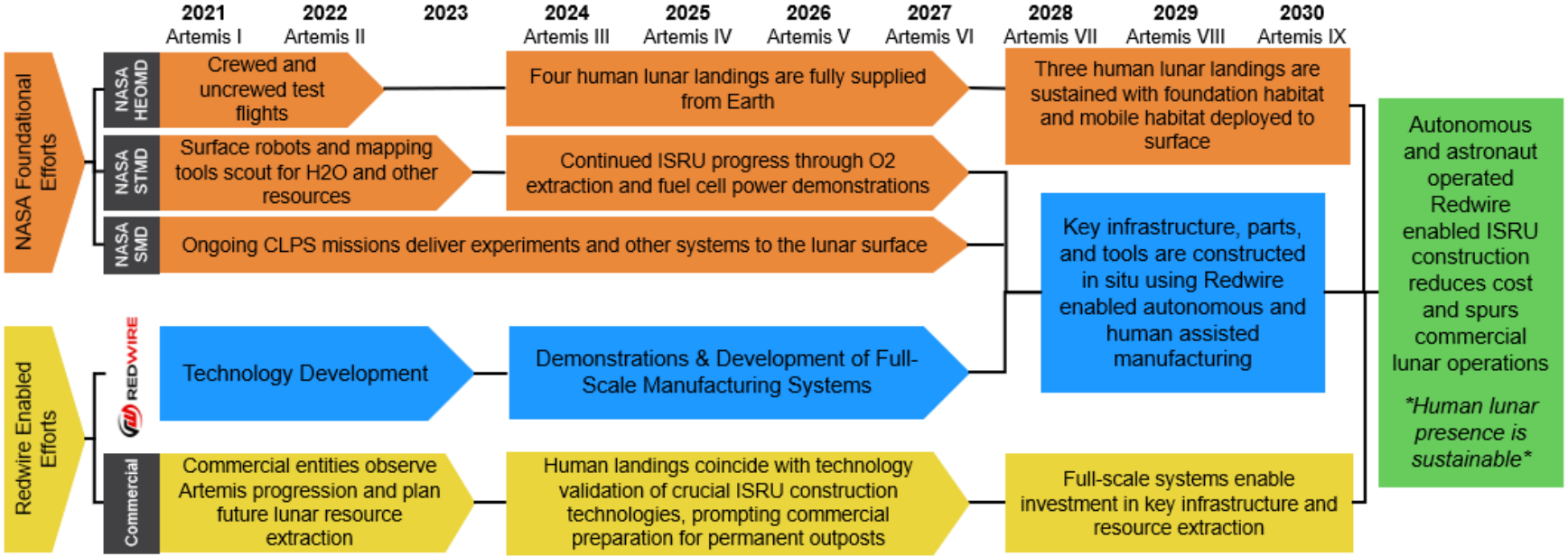


Basalt Fiber

3x lighter, 2.5x higher tensile strength, 100x lower CTE than steel
35% higher impact resistance than glass composites
UV resistant, Noncombustible, Inert to N2 or H20, No EM conduction
Used in industrial furnace lining and fireproof rope
Lunar production & recycling from surface deposits at 1:1 ratios



Vision For Lunar Human Sustainment



Point of Contact

Kari Abromitis
Product Strategist
kari.abromitis@redwirespace.com
630-272-9966